Remarks

The Applicants have amended Claim 25 to recite that the stainless seamless steel pipe has a microstructure comprising a residual austenite phase that is present, but in an amount that is less than about 40% or less, and about 10 to about 60% ferrite and about 25% or more martensite, by volume, in a ferrite and martensite dual-phase as a base phase. Support may be found throughout the Applicants' Specification such as in paragraphs [0018] and [0023], for example. Entry into the official file and consideration on the merits is respectfully requested.

Claims 25, 27-29, 31, 35, 36, 48 and 49 stand rejected under 35 USC §103 over the hypothetical combination of the *ASM Handbook* with JP '009. The Applicants note with appreciation the Examiner's comments and the "Response to Arguments" section with respect to applying the combination against those claims. The Applicants respectfully submit, however, that JP '009 fails to teach the Applicants' claimed subject matter. In that regard, Claim 25 recites that the stainless steel pipe has a microstructure comprising a residual austenite phase that is present, but in an amount that is about 40% or less, and about 10 to about 60% ferrite and about 25% or more martensite, by volume, in a ferrite and martensite dual-phase as a base phase. The Applicants respectfully submit that both of JP '009 and *ASM Handbook* fail to disclose, teach or suggest this structure. Careful scrutiny of the entirety of both documents reveals that there is no mention of a ferrite and martensite dual-phase. On this basis alone, the Applicants respectfully submit that the rejection must fail.

However, the Applicants will address a number of the comments in the rejection. The rejection again frankly acknowledges that "JP '009 does not specifically teach that the steel pipe comprises about 10 to about 60% ferrite phase." The Applicants again agree. The rejection again notes: "however, [0031] of JP '009 teaches that a diffraction of intensity from (211) of

alpha is present. Therefore, ferrite phase is present in the stainless steel pipe." The Applicants respectfully submit that even assuming *arguendo* that ferrite phase is present, this is not relevant. That is because the Applicants' claim about 10 to about 60% ferrite in a ferrite and martensite dual-phase. Thus, there is no mention of the ferrite and martensite dual-phase and there is no mention of the amount of ferrite. The fact that a ferrite phase may be present in JP '009 simply does not render Claim 25 obvious.

The Applicants specifically claim about 10 to about 60% ferrite and there is no disclosure of the amount of ferrite in JP '009, irrespective of whether the ferrite phase is actually present.

The rejection then notes that "the scope of JP '009 is not limited to the specific embodiments that it teaches." The Applicants agree. However, a disclosure must be taken as a whole, including the examples, and the text and test data which is reflected in tables or figures within an overall disclosure. The examples and results of those examples provide facts for those skilled in the art to glean teachings of that prior art in combination with the actual text. What the facts show in JP '009 from the many examples, which are 14 in number, is that the steels of JP '009 have physical characteristics such as the yield strength which is far different from the Applicants' yield strengths. The Applicants' yield strengths are on the order of 413-579 MPa. This is sharply contrasted to the completely different range set forth in JP '009 wherein the yield strengths are over 900 MPa.

Therefore, even if JP '009 is not limited to the specific embodiments shown, those skilled in the art can readily glean that the yield strength for the steels of JP '009 are in a league completely different from those of the Applicants. There is simply too large of a gap between yield strengths well into the 900+ MPa range versus those in the 400 to 500 MPa range for one

skilled in the art to readily conclude that the overall teachings of JP '009, when taken as a whole, lead to the inevitable conclusion that the steels are actually quite different.

This bears directly on the statement in the rejection that "Applicant has not provided evidence to show that the stainless seamless steel pipe of JP '009 is materially different from the pipe of the instant invention. The Applicants respectfully submit that there is no better evidence showing the difference than making an exact comparison of the yield strengths of the Applicants' steel pipes versus those taken directly from JP '009 itself. Moreover, this is not supposition or speculation, these are the results of experiments actually performed by the Applicants versus the explicit disclosure of the prior art document. This is factual evidence that cannot be ignored and is probative of evidence showing a material difference. Thus, there can be no doubt that the JP '009 stainless steel is not inherently the same as the Applicants' stainless steel. Moreover, this demonstrates that despite any similarities in percentages in components or alleged similarities in methods of making these stainless steel pipes, the factual evidence of record is that the steels are materially different and there is no disclosure and no evidence on the record that the stainless steels of JP '009 have a microstructure comprising about 10 to about 60% ferrite and about 25% or more martensite in a ferrite and martensite dual-phase.

However, there are still further compelling relevant facts. According to JP '009, in the measurement of austenite, α by X-ray diffractometry includes not only ferrite, but also martensite. In a simple X-ray diffractometry, martensite and ferrite are not distinctly distinguished. On the other hand, because the structure of austenite is fundamentally dissimilar, it is distinguishable. Herein, γ indicates austenite while α means the other structures. As the method of measuring residual γ amount, the intensity of an X-ray is divided into γ (austenite) and α (martensite, ferrite and so forth of structures other than γ) and the value of austenite is

quantified by the ratios of the intensity. The existence of ferrite does not become definite by the foregoing method.

Ferrite or martensite may not be readily distinguished by X-ray diffractometry, but they are able to be judged from observation of the structure. As shown in Table 2 of JP '009, those steels are entirely tempered martensite and austenite and no ferrite is included. The existence of ferrite is only ascertained in some Comparison examples.

Also, Mr. Kimura, a co-inventor in this application, is the same Mr. Kimura of JP '009. He thus has unique insights as to the JP '009 disclosure. When formula (2) specified in Claim 25 and formula (1) in Claim 1 of JP '009 are compared, although there are some differences in their coefficients, their formulas are similar. The coefficient of C is 43.5, that of Mn is slightly as high as 0.4, while that of Cu is 0.3 which is not included in JP '009 and, therefore, the values calculated by formula (2) in Claim 25 are lower than the values calculated by formula (1) in Claim 1 of JP '009. In the attached Comparison table, A* of Steel No. K in Table 1 of JP '009 is 11.52 whereas the value according to formula (2) specified in Claim 25 is 11.457 which is rather lower. Nevertheless, formula (2) in Claim 25 and the left side member of formula (1) in Claim 1 of JP '009 can be regarded as approximately the same.

Nonetheless, formula (2) in Claim 25 is prescribed as 11.5 or more and formula (1) specified in Claim 1 of JP '009 is prescribed as 10 or less. Hence, the ranges of the formula specified therein are completely <u>opposite</u>.

As set out in the Applicants' Specification in paragraph [0053], if the value of the left side member of formula (2) is smaller than 11.5, the precipitation of ferrite phase becomes insufficient, hot-workability is insufficient and, thus, the manufacture of a seamless steel pipe becomes difficult.

Concerning the foregoing, to prevent generation of ferrite, according to formula (1) in JP '009, the maximum value is limited to 10 in formula (1). The formula (1) was devised under the fundamental concept that a value is set to be not more than a certain amount (herein, 10), wherein the value is obtained from calculations consisting of ferrite forming elements (Cr, Mo and Si) minus austenite forming elements (C, N, Ni and Mn), whereby the component of steel is controlled to be in a range with which the ferrite is able to be prevented from forming. Therefore, Steel Nos. K, N and P include ferrite, as shown in Table 2 of JP '009 which are outside of therange specified by formula (1) of JP '009.

According to Claim 25, contrary to JP '009, there is provided a formula which is similar to formula (2), (because values are obtained by experiments, coefficients slightly vary as the basic component range changes, however, the concepts are fundamentally the same), and the minimum value (herein, 11.5) is specified so that ferrite is present. The steels which satisfy the formula of JP '009 do not satisfy the formula of Claim 25.

From the foregoing, the steels of Claim 25 and JP '009 are thus completely different. The Applicants therefore respectfully submit that JP '009 is simply inapplicable to Claims 25, 27-29, 31, 35, 36, 48 and 49.

The Applicants also respectfully submit that *ASM Handbook* does nothing to cure the deficiencies of JP '009. There is no indication in *ASM Handbook* that reliance on the teachings of *ASM Handbook* would change, for example, the yield strengths of the JP '009 stainless steels. This means that there is inherently no reasonable expectation by one skilled in the art that utilizing the teachings of *ASM Handbook* in conjunction with JP '009 would result in a stainless steel pipe that would be materially the same. The Applicants have already demonstrated that the JP '009 steels are materially different. Withdrawal of the rejection is respectfully requested.

Claim 50 stands rejected under 35 USC §103 over the hypothetical combination of *Metals Handbook Desk Edition* with *ASM Handbook* and JP '009. The Applicants respectfully submit that the *Metals Handbook Desk Edition* fails to provide disclosure, teachings or suggestions to those skilled in the art that would cure the deficiencies set forth above with respect to JP '009 (alone or combination with *ASM Handbook*). There is no evidence in *Metals Handbook Desk Edition* that importing those teachings would change the yield strengths of the JP '009 stainless steels. Moreover, there is nothing in *Metals Handbook Desk Edition* that would cause one skilled in the art to modify the yield strengths of JP '009. In fact, the Applicants respectfully submit that it is at the very core of JP '009 that the stainless steels maintain their high strengths exceeding 860 MPa. This is explicitly set forth in the "Problem to be Solved" section of JP '009 that states that the problem to be solved is "to provide a high strength martensitic stainless steel tube for an oil well having high strength of YS ≥ 125 ksi (860 MPa) …". If one skilled in the art were to import the teachings of *Metals Handbook Desk Edition* into the teachings of JP '009, then one skilled in the art would destroy a primary objective of JP '009 which is to maintain high yield strengths, as opposed to lowering the yield strengths which is exactly what would need to occur to have the Applicants' claimed yield strength of 413-579 MPa.

The Applicants respectfully submit that a rejection hypothetically combining multiple references cannot be maintained when combining the secondary or tertiary reference with a primary reference will essentially eviscerate the primary teachings of the primary reference. Withdrawal of the rejection of Claim 50 is respectfully requested.

The Applicants again acknowledge the provisional rejection of Claims 25, 27-29, 31, 35, 36, 48 and 49 on the grounds of nonstatutory obviousness-type double patenting. The Applicants

again respectfully request that further treatment of this issue be held in obeyance inasmuch as the rejection is provisional.

In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

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Comparison Table

	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	Formula(1)	Formula(2)	M	γ	α	YS	Cu	C+N
min	0.001	0.01	0.1			15	0.5	0.5	0.02	0.001		18.5	11.5	25		10			
max	0.015	0.5	1.8	0.03	0.005	18	5.5	3.5	0.2	0.015	0.006				40	80			0.0025
	US6389821																		
	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	Formula(1)	Formula(2)		γ	α	YS	Cu	C+N
A	0.01	0.22	0.41			11.81	8.8	2.48		0.004		17.483	7.881	100	0	0	585		0.014
B	0.01	0.21	0.4			12.57	5.27	0.8		0.004		16.2785	7.532	88	0	11	627-633		0.014
C	0.01	0.21	1.1			10.4	1.7	0.8		0.004		11.425	8.082	82	0	18	570		0.014
D	0.01	0.25	0.4			12	4	3		0.004		18.2	10.444	68	0	32	580-591		0.014
E	0.01	0.25	0.4			10	1	0.8		0.004		10.75	8.844	80	0	20	578		0.014

	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	Formula(1)	Formula(2)	M	γ	α	YS	Cu	C+N
a	0.008	0.34	0.8	0.01	0.0008	15.1	4.1	2.8	0.06	0.004	0.002	19.385	13.465	74		26	595		0.01
b	0.007	0.34	0.55	0.009	0.0008	16.3	5.1	3.1	0.06	0.005	0.002	21.335	13.8325	70		30	599		0.012
c	0.008	0.34	0.81	0.008	0.0009	16.2	5	2.8	0.04	0.005	0.004	20.01	12.432	86		14	682		0.013
d	0.008	0.29	0.51	0.005	0.0008	14.3	3.8	3.3	0.08	0.009	0.004	18.57	13.2465	66		34	586		0.014
e	0.008	0.35	1.27	0.01	0.0009	15.9	4.5	3.2	0.06	0.002	0.002	20.585	13.831	62		38	588		0.01
f	0.008	0.35	0.56	0.01	0.0008	17	5.4	3.8	0.02	0.002	0.003	22.31	14.617	61		39	587		0.01
g	0.009	0.24	0.48	0.009	0.0008	17	5.8	3.7		0.002	0.003	22.875	14.2705	61		39	648		0.011
h	0.008	0.31	0.4	0.006	0.0007	16	5.8	2.8		0.004	0.004	21.385	12.5055	88		12	679		0.013
i	0.004	0.85	0.58	0.01	0.0008	14.8	3.5	3.3	0.05	0.004	0.003	19.9	13.889	64		36	578	1.5	0.008
j	0.008	0.34	1.08	0.004	0.0009	16.3	4.3	3.1	0.04	0.002	0.002	20.795	14.404	75		25	601		0.01
k	0.008	0.34	0.24	0.008	0.0008	15.1	4	3.1	0.05	0.009	0.005	18.38	13.7295	63		37	578		0.014
l	0.008	0.46	0.55	0.01	0.0007	16.1	4.3	3	0.05	0.005	0.002	20.535	14.31	60		40	562		0.013
m	0.008	0.35	1.08	0.008	0.0008	15	5.2	3.6		0.003	0.002	20.3	12.8225	81		19	637		0.011
n	0.008	0.35	0.83	0.008	0.0008	16.3	5	4.1	0.48	0.004	0.002	21.48	14.878	57		43	553		0.01
o	0.005	0.35	0.57	0.005	0.0009	13.5	3.5	3.5	0.06	0.002	0.002	18.015	13.5115	60		40	581		0.007
p	0.005	0.28	0.13	0.015	0.0012	13	3.8	2.1		0.009	0.003	18.0	9.188	100		0	812		0.014
q	0.007	0.31	0.57	0.014	0.0012	17.1	3.8	3.5		0.002	0.003	21.53	16.3025	26		74	444		0.009
r	0.007	0.71	0.22	0.018	0.0011	16.2	4.5	3.5		0.005	0.004	20.185	14.0315	66		34	575		0.012
s	0.009	0.7	0.4	0.015	0.0015	14.8	3.4	0.8		0.009	0.003	18.745	8.5	100		0	820	0.5	0.018
t	0.01	0.47	0.48	0.018	0.0012	15.3	5	0		0.006	0.003	19.93	9.164	100		0	830	0.6	0.016
u	0.01	0.58	0.5	0.017	0.0015	16.1	5	0		0.008	0.003	19.075	9.435	100		0	843	0.5	0.018
v	0.008	0.18	0.42	0.009	0.001	15.8	5.1	3.1	0.02	0.007	0.002	20.98	13.179	72		28	590	0.3	0.015
w	0.008	0.18	0.42	0.009	0.001	19.5	5	1.5		0.005	0.003	24.14	14.487	68		32	584		0.013
x	0.007	0.25	0.45	0.009	0.001	11.3	2	3.3		0.006	0.003	14.34	12.0365	60		40	560		0.013
y	0.008	0.24	0.48	0.012	0.001	16.1	3	6		0.007	0.002	17.28	13.656	62		38	567		0.013
z	0.008	0.35	0.52	0.011	0.001	18.8	5.8	2.8		0.007	0.002	25.105	12.155	82		18	641		0.015

JP2000-4008

	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	Formula(1)	Formula(2)	M	γ	α	YS	Cu	C+N
min	0.001	0.01	0.1			15	0.5	0.5	0.02	0.001		18.5	11.5	25		10			
max	0.015	0.5	1.8	0.03	0.005	18	5.5	3.5	0.2	0.015	0.006				40	80			0.0025
JP2000-4008																			
	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	Formula(1)	Formula(2)	M	γ	α	YS	Cu	C+N
A	0.028	0.19	0.51	0.02	0.001	13.4	4.34	0.44	0.051	0.076	0.002	[illegible]	7.536	97.2	2.8		848		[illegible]
B	0.024	0.28	0.43	0.01	0.001	12.7	3.54	1.1	0.034	0.025	0.005	[illegible]	8.90	97.9	2.1		860		0.049
C	0.027	0.23	0.45	0.01	0.001	13.4	3.88	1.29	0.052	0.037	0.005	16.028	9.3315	96.2	3.8		820		0.064
D	0.01	0.31	0.42	0.02	0.001	12.7	6.13	2.49	0.041	[illegible]	0.004	17.3285	8.992	98.1	1.9		864		0.07
E	0.023	0.2	0.45	0.02	0.001	13.1	5.06	0.55	0.038	[illegible]	0.004	[illegible]	7.443	95.1	4.9		913		0.059
F	0.017	0.22	0.44	0.03	0.001	13.4	3.75	0.93	0.042	0.053	0.003	[illegible]	8.1635	90.3	9.7		867		0.08
G	0.025	0.24	0.61	0.02	0.001	13.4	4.09	0.18	0.085	0.035	0.004	[illegible]	7.8895	97.3	2.7		832		[illegible]
H	0.023	0.25	0.33	0.01	0.002	12.9	4.19	0.36	0.085	0.056	0.005	15.3105	7.688	98.6	1.4		874		0.079
I	[illegible]	0.3	0.62	0.02	0.001	13.8	3.68	0.51	0.037	0.028	0.003	16.299	8.863	94.1	5.9		911		0.05
J	0.011	0.24	0.49	0.02	0.001	13.8	5.31	0.64	0.051	0.048	0.003	17.592	7.8115	97.5	2.5		867	0.34	0.059
K	[illegible]	0.24	0.39	0.02	0.002	13.1	0.76	0.75	0.01	0.061	0.001	13.504	11.4565	100			939		0.084
L	[illegible]	0.28	0.41	0.01	0.001	10.4	3.09	0.43	0.047	0.037	0.004	17.1865	8.3	89.7	10.3		933		0.065
M	0.028	0.31	0.46	0.02	0.001	13.8	3.55	0.77	0.031	0.018	0.003	14.1885	7.0065	86.8	13.2		843		0.077
N	0.027	0.21	0.46	0.02	0.001	13.5	1.53	0.47	0.015	0.026	0.004	14.3185	10.3105	100	0		932		0.053
O	[illegible]	0.34	0.44	0.02	0.001	13.4	4.97	0.15	0.048	0.012	0.004	18.2185	7.297	87.6	12.4		838		[illegible]
P	0.028	0.21	0.43	0.01	0.001	13	2.15	1.45	0.055	0.078	0.002	14.3075	10.271	99.5	0.5		861		0.106
Q	0.017	0.28	0.41	0.02	0.001	13.3	4.33	0.97	0.051	0.029	0.003	15.3985	8.8535	96.9	3.1		838		0.046
R	0.018	0.21	0.47	0.01	0.001	12.8	4.08	1.01	0.064	0.031	0.003	16.789	8.888	96.4	3.6		917		0.049
S	0.024	0.27	0.43	0.01	0.001	12.6	4.14	0.92	0.032	0.046	0.003	15.7085	7.88	97.3	2.7		848	0.63	0.07
T	[illegible]	0.28	0.5	0.02	0.001	13.2	4.1	1.05	0.069	0.079	0.004	16.3755	8.3	97.9	2.1		969	0.31	0.099